Developing Manitoba's Ethanol Industry

CONSULTING MANITOBANS → MAXIMIZING THE BENEFITS

MANITOBA ENERGY DEVELOPMENT INITIATIVE

Manitoba

MESSAGE FROM THE PREMIER OF MANITOBA

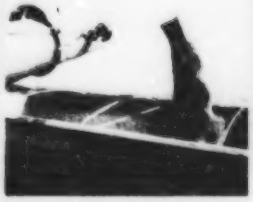
In April 2002, my government announced plans to expand ethanol production and use in Manitoba. This renewable fuel can help preserve our environment while expanding our economic opportunities. We owe it to ourselves – and our children – to explore its vast potential.

You can help by sharing your views. In the coming months we will consult with the public and stakeholder groups throughout the province. This document will provide a framework for these discussions by outlining facts about ethanol, its benefits for Manitoba and the challenges we must overcome to develop the industry.

Thank you for taking the time to consider this important matter. We look forward to hearing your comments and ideas. You can e-mail your thoughts to gmcvicar@gov.mb.ca; write to the Manitoba Energy Development Initiative, 12th floor – 155 Carlton St., Winnipeg, MB, R3C 3H8; call 945-3674 in Winnipeg; or toll-free at 1-800-282-8069, ext. 3674 or fax your comments to 1-204-943-0031.

Yours truly,

Gary Doer
Premier of Manitoba



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Ethanol Facts

- Many countries are adopting ethanol production to reduce harmful emissions from vehicles and enhance economic development.
- Canada's ethanol production is expected to triple, topping 650 million litres by 2010.
- Over 70 per cent of revenue from an ethanol plant is spent within a 150 kilometre radius of the plant site.
- Ethanol-blended fuels are approved under the warranties of all automobile manufacturers selling vehicles in Canada and the United States. Some even recommend ethanol use for its clean-burning benefits.
- Race car drivers have used ethanol for years as a performance fuel because of its high octane value.
- Ethanol production creates new local markets for agricultural producers and increases grain and corn prices. Farmers also benefit from reduced transportation costs.
- Ethanol is one of the tools available for fighting air pollution from vehicles. Ethanol contains 35 per cent oxygen. Adding oxygen to fuel results in more complete fuel combustion, reducing harmful tailpipe emissions. Ethanol also displaces the use of toxic gasoline components such as benzene – a carcinogen. Ethanol is non-toxic, water soluble and highly biodegradable.
- Ethanol is a renewable fuel, typically produced from plant matter, unlike petroleum-based fossil fuels that have a limited supply and are the major contributor of carbon dioxide (a greenhouse gas) emissions.
- The American Lung Association of Metropolitan Chicago credits ethanol-blended reformulated gasoline with reducing smog-forming emissions in the city by 25 per cent since 1990.
- Ethanol reduces tailpipe carbon monoxide emissions by as much as 25 per cent.
- Ethanol has received the ECOLOGO designation from Environment Canada, recognizing its environmental benefits over conventional gasoline.
- Ethanol reduces particulate emissions, especially fine particulates that pose a health threat to children, senior citizens and individuals suffering from respiratory ailments.
- Ethanol-blended fuels account for 12 per cent (and growing) of all automotive fuels sold in the United States.
- Aldehydes, volatile organic compounds, and methanol are associated with the production and use of ethanol. Emissions of these substances can be controlled.
- Ethanol helps prevent winter-related problems by acting as a gas line antifreeze.
- All mainstream manufacturers of power equipment, motorcycles, snowmobiles and outboard motors permit the use of 10 per cent ethanol-blended gasolines in their products.
- The Manitoba economy loses $430 million annually in income transfers for gasoline produced in other jurisdictions. The use of an ethanol-blended gasoline made in Manitoba from Manitoba-grown products can reduce this annual financial drain on the province.

Ethanol is a high-octane, water-free alcohol produced from renewable resources like corn, wheat, straw, wood or other bio-materials. Ethanol is most often blended with gasoline – usually as a 10 per cent mix – to create a fuel called **gasohol**. Ethanol-blended fuels, like gasohol, act as a natural antifreeze, and appear to burn more efficiently in combustion engines.

Field trials of ethanol-blended diesel fuel are underway in Winnipeg. Preliminary results are promising. As well, ethanol is used commercially in producing food-grade vinegar, food extracts, pharmaceutical products, cosmetics, solvents and beverages.

ETHANOL CO-PRODUCTS

Only one-third to one-half of an ethanol plant's total revenue actually comes from ethanol. The rest is derived from co-products generated in the production process. For instance, the primary co-products of wheat-based ethanol can include gluten, specialty flours and feed for livestock. Developing markets that maximize the economic potential of such co-products is critical for the financial viability of any ethanol production facility.

IMPROVING FARM INCOME

It is critical for Manitoba farmers to pursue value-added opportunities, particularly in the wake of the Crow Rate's demise. A local market for wheat used in a Manitoba ethanol facility could save farmers as much as $35 per tonne in shipping costs. The result is improved farm income at no additional cost to Manitobans.

The Manitoba Context

Ethanol production for use as a blending component in Canadian gasoline began in Manitoba at Mohawk's Minnedosa facility in 1981. That facility produces 10 million litres of pure ethanol per year.

Within Manitoba alone, there is a potential market for 140 million litres of ethanol or 1.4 billion litres of gasohol per year. There are significant market opportunities in other Canadian jurisdictions and the U.S. By developing these markets and increasing the number of export-oriented facilities, Manitoba's productive capacity over time could expand to meet markets three or more times the provincial market for ethanol.

REGION	ETHANOL PRODUCED: LITRES/YEAR	GASOLINE CONSUMED: LITRES/YEAR
Manitoba	10 million	1.4 billion
Canada	200 million	38.3 billion
United States	7 billion	500 billion

Manitoba has no oil refineries, making it necessary to import all of its gasoline. Most gasoline enters Manitoba through a product pipeline that delivers gasoline and other petroleum products to a Winnipeg terminal. From there, the gasoline is distributed to various outlets throughout the province. As of August 2001, there were 667 retail outlets, 116 bulk-fuel facilities and 63 card-lock outlets selling gasoline in Manitoba. There are 15 companies distributing gasoline in Manitoba. Four of these companies operate 67 per cent of the gasoline outlets.

Gasohol Incentives

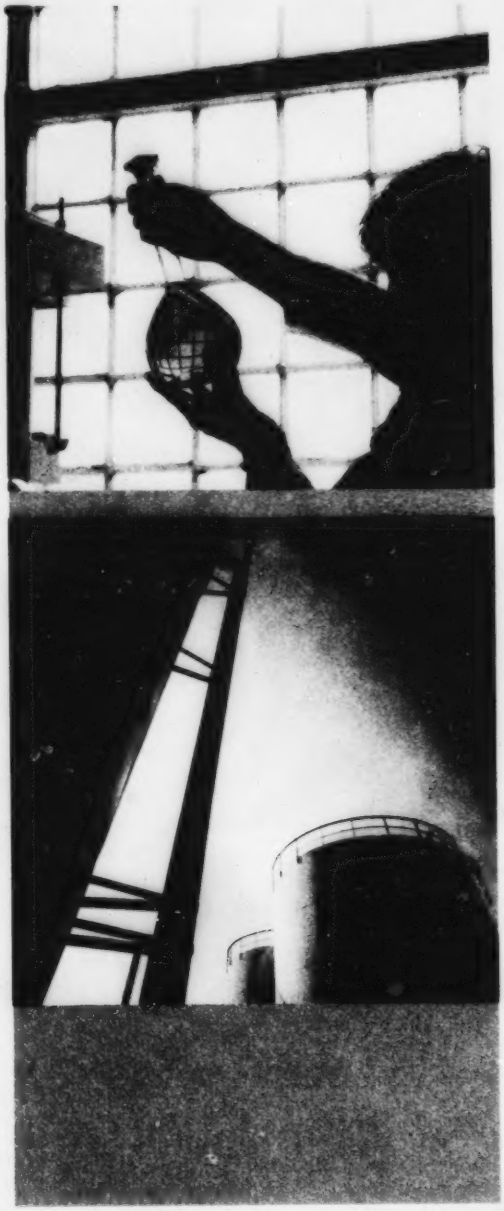
The Manitoba provincial levy on gasoline is 11.5 cents per litre. Currently, the provincial government provides an incentive of 2.5 cents per litre (the most generous in Canada) for gasohol, effectively reducing the levy to 9 cents per litre. In addition, the federal government provides an exemption on its gasoline excise tax of 1.0 cent per litre of gasohol. The total cost to the provincial treasury has never exceeded $2 million annually.

There are many ways government can encourage the expansion of Manitoba's ethanol industry. Following public and industry consultations, we will examine the various options and determine how best to balance all social, environmental, financial and economic considerations.

What is "Mandating" and What Does it Mean for Manitoba?

Mandating, as it relates to fuel ethanol, means legislation dictates that a certain percentage of gasoline must be comprised of ethanol. This legislation can take various forms and be introduced by the federal or provincial government, or both. The Manitoba government is considering mandating an ethanol-blended fuel for all gasoline sold in Manitoba.

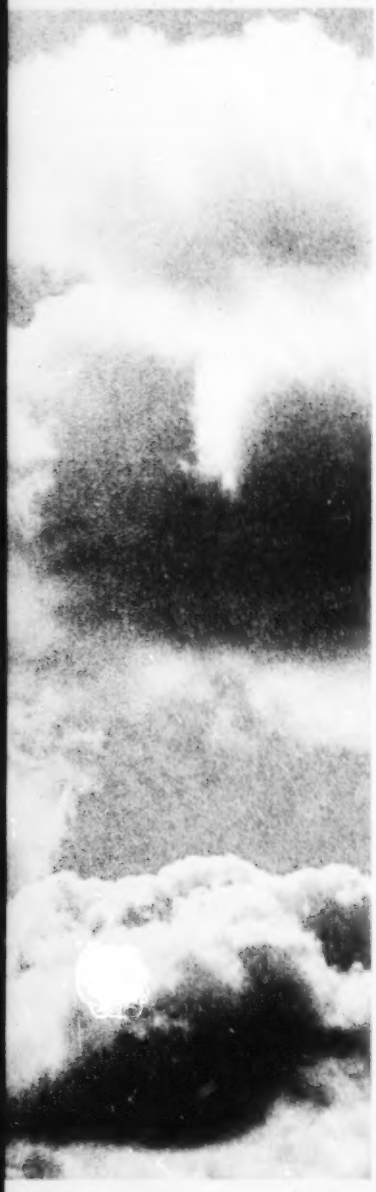
Establishing a 10 per cent ethanol blend in all gasoline sold in Manitoba will:



- create a local market of over 140 million litres of ethanol
- create a market for 14.5 million bushels of wheat and/or other bio-materials (about 10 per cent of current production)
- reduce carbon monoxide produced by vehicles by up to 25 per cent
- reduce greenhouse gas emissions by over 135,000 tonnes
- create high-quality protein feed for Manitoba's livestock industry, equivalent to 140,000 tonnes of distillers' dried grain
- reduce economic drain by $57 million per year — $43 million in reduced expenditure for imported gasoline, combined with a $14 million reduction in federal excise taxes
- creates 200 – 900 new jobs, directly and indirectly, in Manitoba's ethanol industry depending on plant size and co-products produced

Case Study:
Golden Triangle Energy Co-operative ~ Craig, Missouri

Ethanol plants are located all over the United States. This case study describes how an ethanol plant was developed in Craig, Missouri.



The Golden Triangle Energy Co-operative (GTEC) is a New Generation Co-op (NGC) located in northwest Missouri. Income taxes for a NGC are assumed to be paid by the member-owners with no corporate taxes collected. Members of the NGC have the right to supply corn to the plant and receive an end-of-year value-added payment, similar to a stock dividend. The board of directors consists of 13 members who have been active throughout the process. All GTEC board members have made major investments of time and money to help get the project underway.

Craig, Missouri (pop. 347) surfaced as a good location because it had the physical characteristics needed for an ethanol plant, namely: 1) a good water supply 2) access to a natural gas line and 3) a good transportation infrastructure to ship corn to the plant, and to ship the newly-produced ethanol from the plant to market.

The first venture capital commitment for the project was $40,000 (from the Kansas City/St. Joseph, Missouri, Diocese Catholic Charities organization) to promote economic development. Additional venture capital was raised for a total of $180,000.

The St. Joseph Area Chamber of Commerce provided early assistance to the project with in-kind support such as accounting, office help and general project assistance. The chamber acted as a co-ordinating body for GTEC and assisted in raising venture capital.

The sale of shares in GTEC has been an active project of board members, assisted by the St. Joseph Chamber of Commerce. Initial offerings were $12,500 per share. For each share purchased, the shareholder had the right to deliver 5,000 bushels of corn for processing. Subsequently, shareholders were allowed to add to their investment in increments of $1,000, which increased their delivery rights by 385 bushels. Eighty per cent of shareholders are farmers.

The state of Missouri offered generous incentives for the first 12.5 million gallons produced per year and a lower rate for the next 2.5 million gallons. After five years of operation, the subsidy will terminate. Tax credits for investors in the NGC were also available.

The construction of an ethanol production facility presented three main challenges to the GTEC board:

- A spike in corn prices coincided with the initial feasibility work, causing significant delays.
- The board experienced difficulties raising enough investment capital and securing a financial institution.
- No local market has been established for the facility's co-product, resulting in significant costs to ship the livestock feed from Missouri to New Mexico.

One of the board's short-term objectives is to develop a local market for their feed.

The plant began production in February 2001 and today employs 29 people directly. The co-op has 295 members and produces 15 million gallons per year. The ethanol is brokered to a company called Murek. The co-product, distillers' dried grain, is brokered to a company called Commodity Speciality and sold to livestock producers located mostly outside the local region.

Information was supplied by the GTEC and by a case study published by the Illinois Institute for Rural Affairs (Rodney Fink). Other case studies are available on their Web site at www.iira.org.

Case Study: The Minnesota Experience

Over the past two decades, Minnesota has dramatically increased the production and consumption of ethanol within the state. The institution of various credit and promotional programs culminated in a legislated year-round requirement for oxygenated gasoline. It became effective in the Twin Cities area in October 1995 and the remainder of the state in October 1997.

Despite the initiative's current success, the journey was not without its challenges:

- → the negative impact of ethanol fuel tax exemptions on the state highway fund
- → growing imports of ethanol, combined with increased exports of corn feedstock
- → resistance from the petroleum industry to the introduction of ethanol blends
- → eroding consumer acceptance of ethanol-blended fuels
- → troubleshooting perceived as performance problems
- → reluctance of the banking/venture capital industry to finance co-operative-based ethanol facilities, resulting in a need for significant equity incentives from government

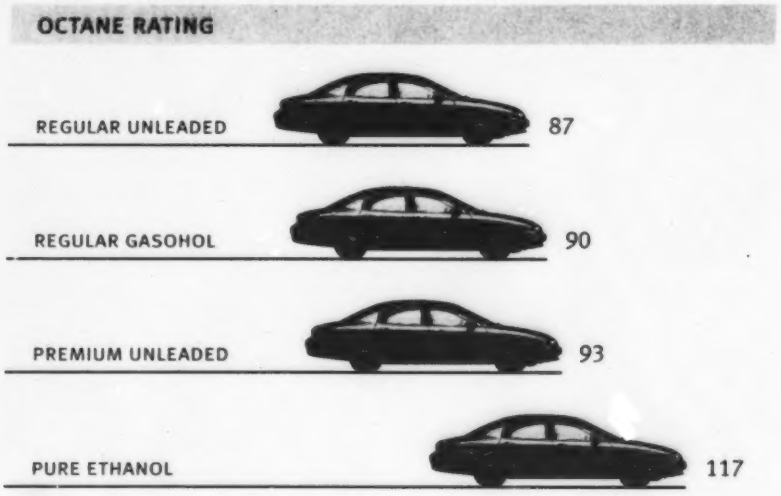
The Minnesota strategy has resulted in:

- → a 97 per cent ethanol blend market share
- → 14 production facilities throughout the state, 12 of which are farmer co-operatives owned by over 8,000 farmers
- → production of over 1 billion litres of ethanol per year
- → replacement of approximately 10 per cent of the state's imported gasoline each year with domestically-produced ethanol

The similarities between Minnesota and Manitoba are striking. Both are strong agricultural jurisdictions and both import nearly all of their gasoline requirements, resulting in a significant drain on income.

ETHANOL PLANTS IN MINNESOTA

What Manitoba Drivers Should Know About Using Ethanol



Ethanol is a high-octane fuel that will operate in all spark ignition engines but is particularly valued for use in high-performance engines requiring high octane.

Ten per cent ethanol-blended gasoline is warrantied by all car manufacturers selling vehicles in North America. Its use will not void warranties on vehicles.

Ethanol is an efficient solvent. It cleans out impurities in the fuel tank and fuel line and deposits them in the fuel filter. Fuel filters should be replaced after the first full tank of ethanol-blended fuel is used. After that, regular fuel filter replacement schedules should be followed.

Ethanol-blended gasoline can be mixed with non-ethanol-blended gasolines. Car owners needn't worry when travelling to areas where ethanol-blended fuels are unavailable.

When blended into gasoline at 10 per cent levels, ethanol provides a natural form of gas line antifreeze — a valuable asset in Manitoba winters.

Although ethanol has a lower energy content than gasoline, it does not appear to reduce mileage when used in 10 per cent blends. This may be due to its additional oxygen content providing a more efficient combustion process. The oxygen also reduces carbon monoxide emissions from the tailpipe.

Why is Manitoba a Good Place to Produce Ethanol?

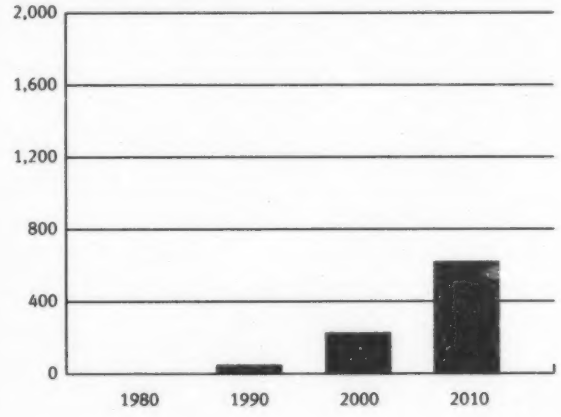
Many advantages make Manitoba an ideal location for ethanol production.

Manitoba has:

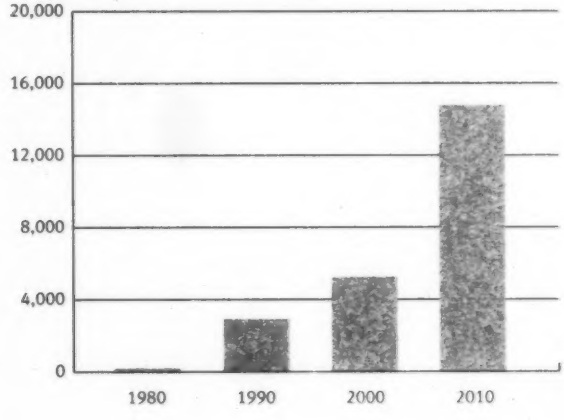
- surpluses of wheat (and other grains), some of which are more costly to export than to sell for ethanol. Manitoba is one of only three provinces with such surpluses
- excellent transportation connections by road, rail and the port of Churchill
- a long history and extensive experience with ethanol, as consumers, retailers, producers and suppliers
- active proponents of ethanol who have the technical and financial expertise to succeed on a small, medium or large scale
- a strong existing incentive program to promote domestic expansion
- a domestic livestock industry that could benefit from economic alliances with the ethanol and co-products industries
- a history of co-operative development that could prove valuable if the co-operative model is pursued by potential Manitoba ethanol producers. This model has demonstrated considerable success in other jurisdictions
- competitive taxes and among the lowest land and utility costs

MARKET POTENTIAL

CANADIAN ETHANOL PRODUCTION OUTLOOK (MILLION LITRES)



U.S. ETHANOL PRODUCTION OUTLOOK (MILLION LITRES)



Challenges for Manitoba

Expanding the production and use of ethanol in Manitoba will pose some challenges that need to be addressed. They include:

engaging the federal government to provide the national leadership, guidance and support necessary to ensure significant growth of the fuel ethanol industry. Currently, there is no national ethanol policy framework to effectively foster the ethanol industry

overcoming a lack of consumer experience and knowledge of the production and use of ethanol-blended fuels. This is critical to gaining widespread consumer acceptance of the fuels' ultimate benefits

building transitional infrastructure, such as blending facilities, to accommodate the production of ethanol-blended fuels

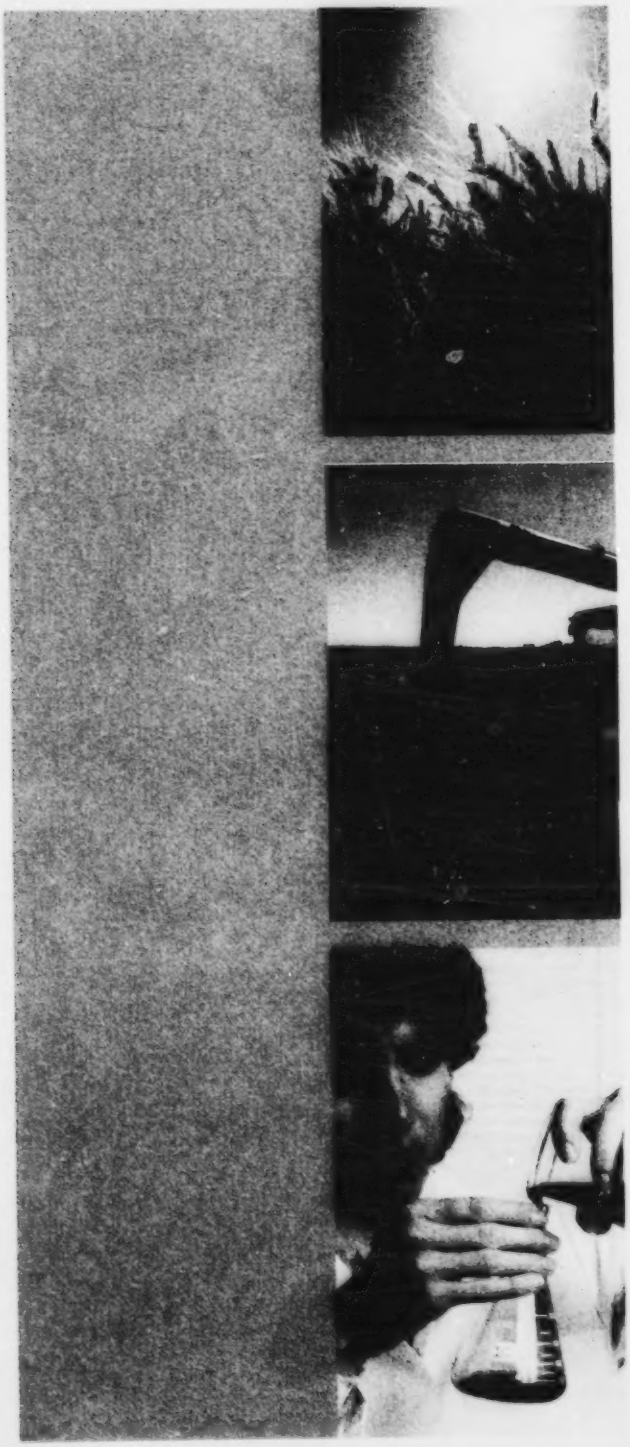
creating links between increased consumption and increased production of fuel ethanol in Manitoba, to help maximize economic development within the province

developing and securing markets for co-products that are generated in the various ethanol production facilities. This includes cultivating new markets for conventional co-products, both local and export, as well as developing specific markets for newly-developed co-products

overcoming potential export trade barriers related to incentives offered to the ethanol industry by some provinces and states in Canada and the United States

Proposed Principles for Developing a Manitoba Ethanol Industry

The following principles have been created to guide the development of the ethanol industry in Manitoba:



- Manitobans will be consulted on how the government should help develop the industry.
- Information regarding ethanol will be provided to interested parties in an open and transparent manner.
- Potential effects on the provincial treasury will be minimized.
- The ethanol industry will be developed in an environmentally-sustainable manner.
- Economic benefits to Manitoba will be maximized.
- Benefits to Manitoba consumers will be maximized.
- Development strategies, including the potential use of incentives, will respect existing trade agreements.
- Development strategies will be sufficiently flexible to accommodate facilities of various sizes, as well as competitive or co-operative business models, while promoting the maximum benefits to Manitobans.

Consultation Questions

1) What are the most important benefits of an expanded ethanol industry? What particular benefits do you see for individuals and communities?

2) What are the most significant barriers to expanding the ethanol industry for producers, consumers, agricultural producers and retailers? How can these barriers be overcome?

3) What are the next steps the government should take to expand the Manitoba ethanol industry?